CIVIL SERVICE
SUPERANNUATION BOARD
OCT - 4 1983

ACTUARIAL REPORT

on the

CIVIL SERVICE SUPERANNUATION FUND

as at

DECEMBER 31st, 1982

TURNBULL AND TURNBULL

The Chairman and Members of the Board,
Civil Service Superannuation Fund,
Winnipeg, Manitoba.

1. Introduction

This Report presents the results of the Actuarial Valuation of the Superannuation Fund made as at December 31st, 1982.

The purpose of this interim valuation is to reveal the financial position of the Fund as at the valuation date.

The financial position of the Fund is determined on the basis of those persons who are participating in the Fund at the valuation date. Separate information is provided to indicate the expected financial effect of the participation of employees who begin to contribute after the valuation date.

Each year, the Fund receives contributions and investment income and pays benefits and expenses. This process continues for as long as there are contributors and persons entitled to benefits.

Each employee contributes while in service, and either he or his beneficiary becomes entitled to benefits when that service terminates.

The amount received by the Fund or paid out of the Fund in future will depend upon future experience and the requirements contained in the Superannuation Act, as they exist from time to time.

The actuary of the Fund estimates these amounts by:

(a) anticipating that there will be no further amendments to the Act, and

(b) making assumptions concerning future experience.

These assumptions are based on actual experience in relevant prior periods. The actual experience is modified where necessary to reflect expected future trends. The choice of assumptions is discussed in a subsequent Section of this Report. These assumptions are needed in order to determine:

(a) the probability that an employee participating in the Fund on the valuation date will still be an employee at each age in the future;

(b) the contributions that are expected to be paid by such an employee at each age in the future;

(c) the probability that, at each age in the future, one of the following events will occur to an employee participating in the Fund on the valuation date: death in service, retirement due to disablement, other retirement, termination of service, or death after pension commences;

(d) the probability that an employee who dies in service will have an eligible survivor;

(e) the probabililty that an employee who has a choice will choose a pension instead of a cash settlement;

(f) the amount which will be paid if each eventuality occurs at each age in the future at which such an event can occur; and

(g) the investment income which can be earned on the assets and future contributions from the valuation date or the date received, if later, until the date the benefit payments and expenses become due.

Some of the present participants in the Fund will likely still be contributing to the Fund each year for at least the next 45 years. Some of the present participants will be entitled to receive benefits from the Fund each year for at least the next 65 years. Contributions are made throughout service and benefits become due only after service ceases. As a result, income is received and expenditures are incurred at different times in the future.

It is possible to compare these amounts at a single date such as a valuation date only by computing the present value of each item of income and expenditure. The present value of an item of income is the amount which, if available now and invested at the assumed rate of return, would accumulate over the years to exactly the same amount as is expected to be contributed at a specified date in the future. The present value of an item of expenditure is the amount which, if available now and invested at the assumed rate of return, would accumulate over the years so that there would be exactly sufficient proceeds of such investment available to pay the expenditure as it becomes due.

The results of these computations are shown in the Valuation Balance Sheet.

2. Source of Information

The information on which the valuation is based included the following:

(a) Diskettes which provided the following information for each employee as at December 31st, 1982: employer code, employee name and identification number, sex, date of birth, date of entry into the Fund, salary received in 1982, the proportion of 1982 worked while an employee to obtain the salary reported, required employee contributions, and total interest on these contributions accumulated to the valuation date.

(b) Diskettes which provided the following information for each pensioner as at December 31st, 1982: employer code, name and social insurance number, sex, date of birth, date of retirement, type of pension, and amount of monthly or annual pension. For each pensioner, the portion of the pension charged to the Fund, now and in the future, was also provided. Similar information was provided for each beneficiary or potential beneficiary.

(c) The following information for each former employee entitled to receive a deferred pension as at December 31st, 1982: employer code, employee identification number, sex, date of birth, age at which pension is expected to commence, and amount of pension payable.

(d) A list of transfers to Reciprocating Employers and to Reciprocating Manitoba Employers.

(e) A list of terminations which occurred prior to January 1st, 1983, but for whom refunds were not processed until after that date.

(f) A record of the general salary increases granted to employees during 1981 and 1982.

(g) A list of changes made to the basic information, such as: sex, department number, employee identification number, date of birth, and date of entry.

(h) Information indicating the installment payments received by the Fund up to December 31st, 1982 in respect of non-pensionable employment and war service from contributors who had payments still to make as at December 31st, 1982.

(i) The financial statements of the Fund including the balance sheet and income and expenditure statements for 1981 and 1982.

(j) The Annual Reports of the Fund for 1981 and 1982.

(k) A detailed list of investments held as at December 31st, 1982.

(l) A copy of The Civil Service Superannuation Act, with amendments to December 31st, 1982.

In addition, we had available copies of prior Actuarial Reports on the financial position of the Fund.

The salaries received in 1982 were adjusted to obtain annual salary rates as at December 31st, 1982. The salaries received in 1982 were first converted to an annual salary for 1982 by dividing the salary by the proportion of 1982 worked while an employee. This annual salary was then adjusted to obtain the annual salary rate applicable as at December 31st, 1982. The adjustment was based on the general increases in salaries granted during 1982 by each participating employer.

The membership of the Plan was reconciled with the membership of the Plan as at December 31st, 1980 and changes in status reported since that date.

The data provided as at December 31st, 1982 was reviewed for missing information, illogical information, and was also compared to the data provided as at December 31st, 1980.

As a result of these procedures, changes were made to approximately 150 records.

3. Membership of the Fund

The information supplied indicated that the membership of the Fund was as follows:

	December 31st, 1982	December 31st, 1980
Employees		
- Males	15,278	14,807
- Females	9,324	8,570
Pensioners		
- Males	2,597	2,268
- Females	1,202	1,068
- Beneficiaries	606	469
Former employees who transferred to a Reciprocating Manitoba Employer and who are entitled to deferred pensions		
- Males	47	40
- Females	20	15
Former employees entitled to deferred pensions		
- Males	213	210
- Females	121	124
Employees who have postponed their retirement		
- Males	44	2
- Females	10	-
	29,462	27,573

4. Operation of the Fund

A number of amendments have been made to the Civil Service Superannuation Act since December 31st, 1980.

Those amendments which had a significant financial effect on the Fund are as follows:

(a) At the 1981 session of the legislature, the practice of crediting interest at the rate of 3% per year on contributions which are refunded was extended from December 31st, 1981 to December 31st, 1982. At the 1982 session of the legislature, a further extension from December 31st, 1982 to December 31st, 1983 was passed.

These amendments caused an increase in liabilities equal to $753,200 as at December 31st, 1980.

(b) At the 1982 session of the legislature, the Act was amended to provide for transfers from the Fund's surplus to the Superannuation Adjustment Account. This provided for the transfers of:

$1,391,100 on December 31st, 1981
1,565,600 on December 31st, 1982 and
1,767,400 on December 31st, 1983.

Those transfers are attributable to excess interest earnings on assets supporting the liabilities of the Fund for pensions in payment.

The transfers in 1981 and 1982 affect the financial position of the Fund as at December 31st, 1982. The value of the transfers in 1981 and 1982 reduced the surplus as at December 31st, 1980 by an amount equal to $2,612,000.

(c) At the 1982 session of the legislature, the pension formula for determining the amount of pension which will be paid was changed, effective July 1st, 1983. This change affects pensions currently being paid as well as pensions which commence on and after the effective date. The new pension formula is as follows:

$$(.02 \times A \times .83 \times S) - (.006 \times C \times .83 \times T)$$

$$+ (.02 \times B \times .17 \times S) - (.006 \times D \times .17 \times T)$$

In this formula:

A is the average annual salary during the highest 7 years of the retired employee's service or during the retired employee's service if it does not total 7 years.

B is the average annual salary during the highest 6 years of the retired employee's service or during the retired employee's service if it does not total 6 years.

C is the average annual Canada pensionable earnings received by the retired employee during the 7 years used for the purposes of determining the value of A for the retired employee or during the retired employee's service if it does not total 7 years.

D is the average annual Canada pensionable earnings received by the retired employee during the 6 years used for the purposes of determining the value of B for the retired employee or during the retired employee's service if it does not total 6 years.

S is the number of years of the retired employee's service including parts of years.

T is the number of years of the retired employee's service after December 31st, 1965, including parts of years.

The average annual salary during the 6 years or 7 years is obtained from the 6 years or 7 years of service in which the salary of the employee is the highest. These years are selected from the last 12 years of service.

Previously the pension formula was based on the average annual salary in the 7 years of service in which the salary was the highest.

This amendment caused an increase in liabilities equal to $3,586,800 as at December 31st, 1980.

The financial position of the Fund as at December 31st, 1982 has been determined taking these amendments into consideration.

Amendments were made in August, 1983 to the Pension Benefits Act of Manitoba. These amendments will cause changes to be made to the Civil Service Superannuation Act. Some of these amendments will have a significant effect on the financial position of the Fund. This Report does not reflect the effect which these amendments will have on the financial position of the Fund.

5. Experience of the Fund

The valuation is based on a set of assumptions as to those factors which will affect the Fund financially in future years. The factors which are of financial significance to the Fund are:

(a) the rate of return earned on the invested assets of the Fund,

(b) the rate at which salaries increase,

(c) the incidence of death after pension commences,

(d) the incidence of death prior to the date the pension commences,

(e) the incidence of termination of service, and the proportion of terminating employees who elect a deferred pension,

(f) the incidence of retirement due to total disability,

(g) the incidence of retirement prior to age 65 for reasons other than total disability, and

(h) the expenses of administering the Fund.

Assumptions are developed in respect of each of these factors in order to determine:

(i) the amounts of the contributions expected to be received and the benefits expected to be paid in each future year on the basis of the present provisions of the Act, and

(ii) the present value of these expected contributions and benefits for the purposes of establishing the present financial position of the Fund.

These assumptions can be divided into the following 2 general categories:

(i) those assumptions which are based on economic conditions or on factors which are not related to changes in status occurring among members of the Fund, and

(ii) those assumptions which indicate the expected utilization of benefits at each age in the future.

The economic assumptions consist of:

(i) the rate of return which is expected to be earned each year on the invested assets,

(ii) the rates at which employees' salaries are expected to increase each year due to inflation and productivity, and

(iii) the expenses of administering the Fund.

A complete study of the experience of the Fund is made at 3-year intervals coinciding with the regular triennial valuations of the Fund.

The expected utilization of benefits has been determined on the basis of assumptions which were used for the 1980 Report.

The economic assumptions are reviewed for all valuations. A small change in these assumptions can have a significant effect on the results.

The following paragraphs describe the results of the review of actual experience for those assumptions being examined for this Report.

(a) Rate of Return on the Assets of the Fund

Rates of return have been calculated for the total assets of the Fund. Rates of return have also been calculated for the fixed income and equity portions of the Fund.

The fixed income portion of the Fund includes bonds, short-term investments with the Minister of Finance, mortgages, units of pooled fixed income investment funds, and accrued interest less the amount of the fixed income investment reserve.

The equity portion of the Fund includes preferred shares, shares or units of pooled equity investment funds, real estate equity investments, and accrued interest.

The total assets of the Fund consist of the fixed income portion, the equity portion, computer equipment and development expenses, furniture and fixtures, cash, plus any amounts receivable less any amounts payable as at December 31st of each year.

The rates of return earned on the Fund each year during the last 5 years are shown in the following table:

Year Ending December 31st	Fixed Income Portion	Equity Portion	Total Fund
1978	9.39%	6.86%	9.22%
1979	9.92	5.81	9.76
1980	10.18	11.93	10.20
Average (1978 - 1980)	9.83%	8.20%	9.73%
1981	11.09%	11.39%	11.07%
1982	11.99	12.66	11.99
Average (1981 - 1982)	11.54%	12.03%	11.53%

The rates of return on the fixed income portion of the Fund are based on the amortized cost of the fixed income investments less the amount of the fixed income investment reserve. Income on the fixed income investments each year is the interest earned less the amount credited to the fixed income investment reserve.

The rates of return on the equity portion of the Fund are based on the book value of the equity investments, as shown in the accounts of the Fund. Income on the equity investments each year is the dividend income plus any profits and less any losses realized on sales in that year.

In our 1980 Report, it was assumed that the rate of return would be 8.50% per year. The rates of return earned during 1981 and 1982 compare favourably with the assumed rate of return.

The rate of return assumed in an actuarial valuation must represent a reasonable balance between current investment rates and the level of investment earnings expected to be realized in the future.

A good indication of the rates of return likely to be available in future years can be obtained from a study of the rates which have been available over a period in the past. It is important that the period studied be long enough to include the effect of a variety of economic conditions, and therefore we have used the 20-year period from January 1st, 1963 to December 31st, 1982. During this period, the average rate of return on each category of fixed income investment in which new investments in the Fund have been made was as shown in the following table:

Investment Category	20-Year Average Rate of Return	Basis
Federal Bonds	8.58%	Long-Term Federal Bonds
Corporate Bonds	9.42	M.Y.W. Industrial and Utility Bonds
General Bonds	9.37	M.Y.W. 40 Bond Yield Average
N.H.A. Mortgages	10.07	N.H.A. mortgage interest rates less 1/10 of 1% for servicing
Conventional Mortgages	10.50	Conventional mortgage interest rates less 1/10 of 1% for servicing

Similar results have not been provided for equity investments, since unlike fixed income investments, an equity investment is attractive only if there is an increase in the value of the investment during the term of the investment. Over long periods in the past, these increases in value have been sufficient to cause the rate of return obtained on equities to exceed the rate of return on fixed income investments. In the last 20 years, there have been significant fluctuations in the value of equity investments. As a result, the dates on which such investments are purchased and sold have an important influence on the results that are obtained.

It has been assumed that, in future, it will be possible to choose these dates with sufficient skill so that the rate of return obtained on equity investments will be at least as high as the rate of return which could have been obtained on fixed income investments. As it is possible to allocate all of the Fund to fixed income investments, it is reasonable to assume that existing investments in equities will be retained, and new investments in equities will be made only if such investments are expected to produce a higher rate of return than fixed income investments. Otherwise, investments in equities would not be justified.

The amounts invested in short-term investments have been excluded from this tabulation. Such investments are used to produce income for the Fund until it is appropriate to make more permanent investments. Use of this procedure helps to increase the rate of return earned by the Fund.

Over the 6-year period prior to the valuation date, the new fixed income investments of the Fund were distributed by category in the following proportions:

Investment Category	Proportion
Federal bonds	20.56%
Corporate Bonds	34.71
General Bonds	2.02
N.H.A. Mortgages	31.86
Conventional Mortgages	10.85
	100.00%

This information can be used to determine the expected rate of return which will be obtained in future years if it is assumed that:

(i) the distribution of new fixed income investments by category over the 6-year period is a good representation of the investment policy which will be followed in the future, and

(ii) any equity investments will produce at least as high a rate of return as fixed income investments.

A rate of return of 9.57% per year is produced by the use of this distribution of new fixed income investments for the 6-year period prior to the valuation date, and the 20-year average rate of return obtained on each category of fixed income investments.

A similar procedure was used to determine the rate of return expected in the 1980 Report. During the 20 years prior to December 31st, 1980, new investments produced a rate of return which was equal to 8.52% per year, on average. This rate led to an expected rate of return of 8.50% per year.

The higher rate of return obtained during the latest 20 years is due to an environment in which investors in bonds and mortgages obtained rates of return that were more attractive than during any significant period of time in the past.

In the last 5 months of 1982, there was a large decline in the rate of interest available on new fixed income investments. There has been no significant change in interest rates in 1983. For bonds and mortgages, this decline has caused the rate of return obtained to be 11% to 13% per year. In the first 6 months of 1982, the corresponding averages were 15% to 19% per year.

A decline of this magnitude makes it desirable to allow for the possibility that the rates of return which are available in future will be less than the rates of return which were available during the latest 20-year period.

This allowance could be made by excluding from the calculation the very high rates of return that were available during the last 6 months of 1981. If this is done, the 20-year average rate of return becomes 9.35% per year after allowance is made for investment related expenses.

On the basis of the foregoing considerations, it is reasonable to expect that the Fund will earn a rate of return of at least 9.25% per year, on average, in the future.

The assumed rate of return will be the same as the actual rate if there is no change in the distribution of investments by category, and no gains or losses are realized on the sale of investments. The same or better results would be achieved if any losses are more than offset by an increase in the investment income.

A good indication of the portion of the assumed rate of return of 9.25% per year which can be considered as the inflationary component can be obtained by determining the average annual rate of increase in the Consumer Price Index. During the 20 years prior to December 31st, 1982, the Consumer Price Index increased by an average of 6.53% per year.

If the inflationary component in the assumed rate of return is 6.50%, the real rate of return is expected to be 2.75% per year. In our 1980 Report, the inflationary component was 5.50% per year and the real rate of return was expected to be 3.00% per year.

There are 2 reasons for identifying the 2 parts of the rate of return. These are:

(i) The assumed rate of return is based on an assumption as to future economic conditions. So also is the assumption made as to the rate at which salaries will increase in future years. Consequently, in order to ensure consistency the same allowance for inflation, i.e. 6.50% per year, is used in developing both actuarial assumptions.

(ii) By identifying the real rate of return, a good indication can be obtained of the significance of the rate assumed in other than average economic conditions. The assumption of a real rate of return of 2.75% per year implies that investments obtained for the Fund are expected to yield a rate of return of 2.75% per year in excess of the average rate of inflation during the period these investments are held.

In our 1980 Report, the assumed rate of return was 8.50% per year. The increase in the assumed rate is attributable to an increase in the inflationary component of the rate of return. The increase would have been larger had there not been a reduction in the expected real rate of return.

(b) Rates of Salary Increase

Salary increases occur as a result of:

(i) general increases. These increases in salary are granted to all employees and reflect changes in economic conditions, and

(ii) service, merit and promotional increases. These increases in salary are granted on an individual basis to recognize an employee's service and increased value to the organization.

Each class of increase is considered separately in developing the rates at which salaries can be expected to increase in the future.

(i) General Increases in Salary Levels

The 2 components of general increases in salaries are:

(A) the inflationary component. Employees seek increases in salary in order to offset any decreases in purchasing power which are caused by inflation, and

(B) the productivity component or increase in the standard of living component. The productivity component consists of that portion of general increases in salaries which are not offset by inflation. These increases are due to factors such as increases in the real value of goods and services produced per employed person. An increase in productivity is made possible by the greater use of automated or other equipment. Other increases can occur as a result of increases in qualifications needed to fulfill a position.

The inflationary component of future increases in salaries should be the same as the inflationary component included in the rate of return assumed to be earned on the assets of the Fund in future years. As explained in the previous subsection of this Report, the period used requires the allowance made for inflation in the future to be at the rate of 6.50% per year.

The productivity component is based on a study of increases in the average salaries of employed persons in Canada during the 20-year period prior to December 31st, 1982. The productivity component is obtained by deducting the inflationary component from these increases in salaries. During this period, the productivity component was equal to 1.96% per year.

The productivity component has decreased steadily in recent years. In the last 6 years, the standard of living has decreased by an average of .30% per year.

Past increases in the standard of living were greater than increases in productivity during the same period. It is likely that at least part of this difference will need to be absorbed before normal increases occur. This will cause increases to be lower in the future than they have been over long periods in the past.

On the basis of these considerations, an allowance of 1.00% per year was made for the productivity component of general salary increases. This is lower than the allowance made in previous years. In previous Reports for the period 1974 to 1980 the allowance made for increases in salary due to productivity was equal to 1.25% per year.

The expected general increases in salary are obtained by adding together the increases expected to occur in each component. On that basis, general increases in salary are expected to occur at a rate equal to 7.50% per year in future, on average, this rate consisting of an average expected productivity increase of 1.00% per year plus an allowance for future inflation at a rate of 6.50% per year.

(ii) Service, Merit and Promotional Increases

The assumptions made regarding increases in salary due to service, merit, or promotion are the same as those adopted for use in our 1980 Report.

(c) <u>Expenses of Administering the Fund</u>

In the 1980 Report, we showed the present value of the expenses expected to be incurred in administering the Fund. A portion of this value contained an allowance for administrative expenses in 1981 and 1982. The allowance was equal to $1,034,400 during these 2 years. The actual administrative expenses were similar to this amount during these years.

The close relationship between actual and expected expenses during the 2 years under review justifies the continued use of the procedure used in the 1980 Report for determining expected future expenses.

The estimated expenses of administering the Fund during 1983, 1984 and 1985 are based on the expenses incurred in 1982. It is assumed that administrative expenses will increase at the same rate as salaries. The present value of these expenses is equal to $1,809,300. This amount is shown in the Valuation Balance Sheet as a provision for future Fund expenses.

6. Summary of Actuarial Assumptions Used in this Valuation

As this is an interim valuation, the financial position of the Fund, with 3 exceptions, has been determined on the basis of the assumptions used in the 1980 Report. The 3 economic assumptions have been modified in accordance with the procedure described in the preceding section of this Report. These assumptions are based on the study of relevant experience generated by the Fund in the year immediately prior to that date.

(a) Annual Rate of Return on the Assets of the Fund - 9.25%.

(b) Annual Rates of Salary Increase (including an allowance of 7.50% per year for future general increases in salary levels):

Age	Males	Females
20 - 25	15.9%	14.0%
25 - 30	13.0	11.7
30 - 35	10.8	10.9
35 - 40	9.5	10.2
40 - 45	8.9	10.1
45 - 50	8.6	9.2
50 - 55	8.3	8.7
55 - 60	8.1	8.5
60 - 65	7.9	8.2

It has been assumed the Yearly Maximum Pensionable Earnings under the Canada Pension Plan will increase at the rate of 12.50% per year until it catches up to the average earnings of Canadians, after which it will increase by the allowance for general increase in salary - 7.50% per year. The future average earnings in Canadians is determined by increasing the Average Weekly Earnings Industrial Composite (published by Statistics Canada) as at the valuation date by the allowance made for general increases in salary - 7.50% per year.

(c) Annual Rates of Death after Pension Commences (for selected ages):

Attained	Non-Disabled		Disabled		Survivors	
Age	Males	Females	Males	Females	Widowers	Widows
30	N/A	N/A	N/A	N/A	.0009	.0005
40	N/A	N/A	.0756	.0403	.0018	.0009
50	N/A	N/A	.0674	.0359	.0058	.0021
60	.0114	.0055	.0713	.0380	.0138	.0052
70	.0326	.0162	.0971	.0518	.0320	.0158
80	.0823	.0480	.1749	.0933	.0814	.0476
90	.2086	.1725	.3473	.1852	.2072	.1724
100	.4634	.4494	1.0000	1.0000	.4634	.4494

(d) Annual Rates of Death Prior to the Date the Pension Commences (for selected ages):

Attained Age	Males	Females
20	.0006	.0003
30	.0009	.0005
40	.0018	.0011
45	.0032	.0016
50	.0058	.0024
55	.0093	.0037
60	.0138	.0059
64	.0190	.0089

(e) Annual Rates of Termination of Service (for selected ages):

(i) leading to a lump-sum payment or a deferred pension:

Attained Age	Males	Females
20	.1040	.2280
30	.0472	.1330
40	.0198	.0500
45	.0142	.0380
50	.0098	.0295
55	.0062	.0160
60	.0050	.0075
62	.0024	.0050

(ii) proportion of eligible terminations expected to elect a deferred pension:

Attained Age	Males	Females
20	N/A	N/A
30	.3010	.3280
40	.3090	.4260
45	.3990	.4380
50	.5140	.4870
55	.5090	.5030
60	.7850	.7860
62	1.0000	1.0000

(f) Annual Rates of Retirement due to Total Disability (for selected ages):

Attained Age	Males	Females
35	.0005	.0010
40	.0010	.0020
45	.0015	.0030
50	.0020	.0040
55	.0080	.0040
59	.0080	.0120

(g) Annual Rates of Retirement for Reasons other than Total Disability (for selected ages):

Attained Age	Males	Females
55	.0266	.0423
57	.0166	.0269
59	.0260	.0502
61	.0946	.1590
63	.1707	.2193
65	1.0000	1.0000

(h) Provision for Future Administration Expenses during the next 3 years - $1,809,300.

7. Valuation Results - Present Participants in the Fund

(a) Benefits included in the liabilities

The Fund consists of the accumulation of those contributions and other payments that were made during the period of employment of the present participants. This accumulation will be used to finance a portion of the benefits which these participants have been promised under the Act. The portion of the benefits so financed includes:

(i) a specified portion of each pension currently being paid,

(ii) 50% of the pensions being earned by those present employees who are not employed by an employer who is matching employee contributions,

(iii) 100% of the pensions being earned by those present employees who are employed by an employer who is matching employee contributions,

(iv) refunds of employee contributions, plus interest, on termination,

(v) the value of employee contributions transferred under reciprocal agreements, and

(vi) the value of employee contributions paid on death (plus interest, in the case of contributions made by employees of an employer who is matching employee contributions).

The remainder of the benefits are financed by the Province and its agencies on a pay-as-you-go basis.

This valuation relates to the benefits which are earned during employment and the assets and contributions available to finance these benefits. The portion of the benefits to be financed by the Province and its agencies are not considered to be a liability of the Fund.

(b) Valuation Procedure

The financial position of the Fund is indicated by the relationship between:

(i) the present value of the liabilities of the Fund has in respect of the benefits promised, and

(ii) the present value of the funds available to finance these liabilities as they become due.

The actuarial valuation is the process whereby this relationship is quantified.

The present value of the liabilities of the Fund is determined separately for each benefit which the Fund provides. For each benefit, each employee, and each future year of service in the Fund, we determine:

(i) the probability of a benefit becoming payable at each future age based on the actuarial assumptions outlined in the previous Section of this Report,

(ii) a discount factor which makes allowance for the portion of the benefit which it is expected will be financed by future investment earnings, and

(iii) the amount of the expected benefit. The benefit expected to be paid is based on service completed prior to the valuation date, plus service expected to be completed after the valuation date but prior to the occurrence of the event that is causing the benefit to be paid. The expected benefit is calculated using the salary expected to be received prior to the occurrence of this event.

The present value of the liabilities for each benefit for each employee is the sum of the product of these 3 components over all possible future years of service for that employee. The present value of the Fund's liabilities for each benefit is the sum of the present value obtained for each employee.

The present value of the liabilities of the Fund in respect of pensioners and former employees entitled to a deferred pension is determined by a similar process except that the amount of the benefit is based on the amount of pension being paid at the valuation date or the amount of pension which will become payable in the future.

The principal sources of funds available to finance the liabilities of the Fund are:

(i) the present assets of the Fund, and

(ii) the contributions expected to be made to the Fund by the employees and the employers who are matching employee contributions.

The value of future contributions excludes the 10.20% of total contributions which can be used only to finance increases in pensions when there are increases in the cost of living after the pension commences. The value of future pensions does not include any allowance for the additional pensions which are expected to be produced by such contributions.

The financial position of the Fund, with respect to present participants, is shown in the Valuation Balance Sheet. No allowance has been made for new entrants.

While new entrants to the Fund in future years will affect the financial position, their number and distribution by age, sex and salary is less easy to predict than the other factors taken into account in the valuation. Consequently, the effect which new entrants to the Fund in future years will have on the financial position of the Fund has been considered separately and is discussed in a subsequent Section of this Report.

The financial position of the Fund with respect to the present participants is shown in the Valuation Balance Sheet.

(c) Guarantee of Rate of Return

The Province has agreed to make additional payments to the Fund if, in any year, the rate of return earned on the Fund's investments is less than the rate of return which is guaranteed in that year. The guaranteed rate is equal to .50 of 1% more than the natural rate of return. In this Report, the natural rate of return is 9.25% per year. If the rate of return is less than 9.75% per year, the Province makes a payment to the Fund. The payment is equal to the difference between the amount which would have been earned on investments during that year had the guaranteed rate been obtained and the amount actually earned.

As a result of this procedure, a rate of return equal to 9.75% per year is guaranteed during 1983. The next triennial Report, to be prepared as at December 31st, 1983, will provide information on the guaranteed rate for the following 3 years. If the rates of return are maintained at present levels or increased, no payment will be required to be made by the Province in these years.

The initial purpose of the guarantee was to act as an offset to the unfunded liability which was disclosed in our 1974 Report and which increased as a result of amendments made to the Act in 1976 and 1977.

A further reference to this guarantee is to be found in a note attached to the Valuation Balance Sheet.

Civil Service Superannuation Fund
Valuation Balance Sheet
as at December 31st, 1982

ASSETS

Invested Assets:		
Fixed Income (amortized cost)	$349,051,296	
plus: Investment Reserve	140,893	
less: Superannuation Adjustment Account	(20,877,390)	$328,314,799
Equities (book value)		24,400,858
Net Invested Assets		$352,715,657
Computer Equipment		47,840
Computer Systems Development Expenses		7,094
Amount due from Province under Section 24(1)		1,826,300
Accounts Receivable		71,010
Value of Future Contributions Expected to be Received		
- present employees	$459,203,200	
- Employers who are matching employee contributions	3,712,600	462,915,800
TOTAL ASSETS		$817,583,701

Less:		
LIABILITIES		
Value of Fund's Liabilities in respect of Current Benefits		
- retirement pensions	$ 62,073,900	
- survivors' pensions	7,261,400	$ 69,335,300
Value of Fund's Liabilities in respect of Future Benefits Earned for Service to December 31st, 1982		
(a) present employees		
- retirement pensions	$234,211,300	
- survivors' pensions	20,794,800	
- deferred pensions	16,683,400	
- contributions paid on death	979,700	
- refunds of contributions on termination	15,920,300	
(b) former employees		
- deferred pensions	4,496,400	293,085,900
Value of Fund's Liabilities in respect of Future Benefits Expected to be Earned by Present Employees for Service on and after January 1st, 1983		
- retirement pensions	$313,842,900	
- survivors' pensions	24,900,500	
- deferred pensions	21,401,400	
- contributions paid on death	3,088,100	
- refunds of contributions on termination	21,431,900	384,664,800
Value of funds to be transferred under Reciprocal Agreements		1,475,100
Value of deferred pensions to be paid as a result of transfers to reciprocating Manitoba employers		1,757,300
Accounts Payable		386,911
Provision for Future Fund Expenses		1,809,300
Installment payments to include prior non-pensionable employment under Section 60		397,964
Installment payments to include periods of war service under Section 33		965,950
TOTAL LIABILITIES		$753,878,525
SUSPLUS		$ 63,705,176

Notes:

1. The portion of the invested assets which is attributable to the Superannuation Adjustment Account has been deducted from the assets of the Fund. These assets are used to finance increases in pensions made as a result of increases in the cost of living after the pension commences. None of these assets are available to help finance the other benefits promised under the Act.

2. The amount shown as accounts payable includes:

accounts payable	$ 9,282
contributions and interest refundable	377,629
	$386,911

In 1979, the practice of including contributions and interest refundable as part of the accounts payable shown in the financial statements was dropped. Contributions and interest payable was determined by adding up the individual amounts for those former employees entitled to a refund but not paid as at December 31st, 1982.

3. The financial results produced in this Balance Sheet are based on an assumed rate of return of 9.25% each year in the future. These results make no allowance for the financial effect of the guarantee of the rate of return.

The guarantee made by the Province provides assurance that the Fund will earn a rate of return of at least 9.75% in 1983. If there is no change in the assumed rate of return at subsequent valuations, the Fund is assured of earning a rate of return of at least 9.75% per year in future.

The existence of the guarantee will not cause any payments to be made to the Fund in 1983 and it is unlikely to cause any payments to be made in the next few years. As a result, the Fund will not be any larger immediately as a result of the guarantee. Over time it is reasonable to expect that the guarantee will cause some additional payments to be made to the Fund.

The existence of this guarantee can be recognized either fully, partially or not at all. The objective of the guarantee is to help ensure the solvency of the Fund.

In this Report, it was not necessary to rely on the guarantee at all. This decision is in accordance with the purpose of the guarantee.

If the existence of the guarantee had caused the use of a higher rate of return, there would have been:

(a) a further improvement in the financial position of the Fund, and

(b) a further reduction in the excess investment earnings that are obtained each year in the future.

Any reduction in excess investment earnings makes it harder for a surplus to be obtained and more likely for an unfunded liability to be revealed at a future valuation date.

8. Analysis of Valuation Results

The Valuation Balance Sheet discloses a surplus of $63,705,176 as at December 31st, 1982. In our 1980 Report, a surplus of $7,027,817 was disclosed. Part of this surplus was used to finance amendments to the Act.

The financial position of the Fund as at December 31st, 1982 can be reproduced if the surplus as at December 31st, 1980 is adjusted to recognize the various changes in the financial position which occurred during 1981 and 1982. This procedure is demonstrated in the following schedule:

Surplus as at December 31st, 1980	$ 7,027,817
Reduction in surplus caused by amendments to the Act effective July 1st, 1983	(6,952,000)
Interest earned on surplus remaining, at the rate assumed in the 1980 Report	13,400
Expected surplus as at December 31st, 1982, before allowance is made for actual experience during the period under review	$ 89,217
Effect of actual experience during period under review	8,979,359
Surplus as at December 31st, 1982, before allowance is made for changes in expected future experience	$ 9,068,576
Net improvement in financial position due to changes in expected future experience	54,636,600
Surplus as at December 31st, 1982	$63,705,176

The greater than expected investment earnings influenced the actual experience during 1981 and 1982 and improved the financial results. The improvement in the financial position due to this source was equal to $19,434,000.

The greater than expected increases in salary influenced the actual experience during 1981 and 1982 and had an adverse effect on the financial results. Greater than expected increases in salaries caused an increase in liabilities of the Fund which was greater than the value of the increase in future contributions.

The following changes made to the actuarial assumptions improved the financial results:

(a) An increase in the assumed rate of return of the Fund.

(b) A decrease in the allowance made for increases in salary due to increases in productivity in the future.

The increase in the rate at which general increases in salary are expected to occur in future years as a result of inflation had an adverse effect on the financial results.

9. Valuation Results - Future New Entrants

It is important to determine the effect which future new entrants will have on the financial position of the Fund. This effect is a function of the relationship between the benefits which the new entrants can expect the Fund to provide and the contributions they are expected to make. This relationship can be quantified by:

(a) expressing the cost of the basic benefits expected to be provided by the Fund as a percentage of the salary expected to be earned after entering the Fund, and

(b) comparing this percentage to the percentage of salary which will be contributed to the Fund.

The relationship is dependent on the distribution of the new entrants by age, sex and salary. For this purpose, it has been assumed that the distribution will be the same as it was for present employees who are members of the Fund at their date of entry into the Fund.

If the assumptions on which this Report is based are realized during the period that future new entrants are members of the Fund, the cost to the Fund of providing them with the basic benefits promised under the Act is as shown in the following table. The rates of contribution required to be made by the present employees who are members of the Fund are also shown:

	Theoretical Contribution Rates based on Valuation Assumptions	Contributions Rates Required by the Act for Basic Benefits	Margin
On Canada Pension Plan Earnings	4.3%	4.6%	.3%
On Earnings in excess of Canada Pension Plan Earnings	5.9	6.3	.4

The existence of a margin in the contribution rates ensures that the financial position of the Fund will not be adversely affected when new entrants begin to contribute to the Fund.

10. Comments and Recommendations

During the last 2 years, the financial position of the Fund has been affected by changes in actual and expected experience. These changes are automatically reflected in the financial results obtained.

The results obtained indicate that there has been a significant improvement in the financial position of the Fund during the period under review.

The assets of the Fund, together with the contributions expected to be made in future by and on behalf of present employees, are sufficient to pay the Fund's share of the benefits promised under the Act, as these benefits become due.

The surplus can be used in any way considered to be desirable. In considering the use to be made of this surplus you will want to make allowance for the adverse financial effect of changes in legislation affecting pension plans in Manitoba.

It is our intention to suggest additions and changes to the procedures now being used to calculate the investment reserve. These suggestions recognize the wider variety of investments now being made for the Fund. Adoption of these suggestions would cause up to $5,000,000 of the surplus to be allocated to the investment reserve.

We shall be pleased to discuss this Report with you at your convenience.

DATED at Winnipeg, this 30th day of September, 1983.

Respectfully submitted,

John A Turnbull.

Actuary

POOR

QUALITY

ORIGINAL